REMARKS

Applicants respectfully request that the above application be reconsidered, as amended. Claims 4-5, 7-9, 12-16, 18-19, and 22-26 are currently pending.

Claims 1-3 (ceramic composition) have been rewritten as new Claim 24. In view of new Claim 24, Claims 4-5 have been amended accordingly, including changing the dependency to new Claim 24.

Claims 6 and 10-11 (thermally protected article) have been rewritten as new Claim 25. In view of new Claim 25, Claims 7-9 and 13 have been amended accordingly, including changing the dependency to new Claim 25.

Claims 17 and 20-21 (method for preparing thermal barrier coating) have been rewritten as new Claim 26. In view of new Claim 26, Claims 18 and 22-23 have been amended accordingly, including changing the dependency to new Claim 26.

In addition to the cancelled Claims, support for new Claims 24-26 can be found from a combined reading of paragraphs [0009]-[0011] at pages 3-4, paragraphs [0020]-[0021] at pages 5-6, and paragraphs [0025]-[0026] at pages 7-8 of the above application.

A. Response to Rejection of Claims 1-2 under 35 USC 102(e) as Anticipated by Zhu et al.

At page 2 of the Office Action, the Examiner has again rejected Claims 1-2 under 35 USC 102(e) as anticipated by U.S Patent 6,812,176 (Zhu et al.).

Zhu et al. discloses thermal barrier coating (TBC) compositions comprising a base oxide (zirconia and/or hafnia), a primary stabilizing oxide (yttria, dysprosia, erbia or combinations thereof), and a pair of Group A (preferably scandia and/or ytterbia) and Group B (preferably neodymia or gadolinia) dopant defect cluster-promoting oxides. See abstract and col. 1, line 66 through col. 2. line 11. See also Example 1 to 4 at col. 4-5 of Zhu et al. disclosing four specific TBC compositions comprising zirconia as the base oxide, yttria as the primary stabilizer, ytterbia as the Group A dopant and either samaria, neodymia, gadolinia or neodymia/scandia as the Group B dopant.

Contrary to what the Office Action suggests at page 2, Zhu et al does not specifically teach or suggest the inclusion in its TBC compositions of lanthana, alone or in combination with

gadolinia, neodymia, samaria or dysprosia according to the ceramic composition of cancelled Claims 1-2. While the Office Action relies on column 2, lines 60-65, of Zhu et al. to teach the inclusion of lanthana in its TBC composition, all that this passage of Zhu et al. says is that the group A dopant is "less preferably any other rare earth oxide." Given that there are over a dozen different "rare earths" and that Zhu et al. deems the "rare earth oxides" to be "less preferred," this is not a clear teaching or suggestion of the use of lanthana, and particularly as the second stabilizer metal oxide in combination with the first stabilizer metal oxide (e.g., yttria) and third stabilizer metal oxide (e.g., ytterbia) of cancelled Claims 1-2.

In further response to this rejection, Claims 1-2 have been rewritten as new Claim 24 that recites a ceramic composition comprising: (1) from about 92 to about 95 mole % zirconia; and from about 5 to about 8 mole % of a stabilizer component comprising: (a) a first metal oxide selected from yttria, calcia, ceria, scandia, magnesia, india and mixtures thereof in amount of from about 3 to about 5 mole %; (b) a second metal oxide selected from lanthana, alone or in a mixture with gadolinia, neodymia, samaria, or dysprosia, in an amount of from about 0.25 to about 2 mole %; and ytterbia in an amount of from about 0.5 to about 2 mole %.

Zhu et al. especially does not teach or suggest the ceramic composition of new Claim 24 comprising from about 92 to about 95 mole % zirconia, and in particular does not disclose or suggest the stabilizer component combination of: (a) the first metal oxide (e.g., yttria) in amount of from about 3 to about 5 mole %; (b) the second metal oxide being lanthana, alone or in a mixture with gadolinia, neodymia, samaria or dysprosia, in an amount of from about 0.25 to about 2 mole %; and (c) ytterbia in an amount of from about 0.5 to about 2 mole %. Compare also new Claim 24 to Claim 5 (prior to amendment) that page 4 of the Office Action says would be allowable if rewritten in independent form.

Accordingly, Claim 24 is novel and unobvious over Zhu et al.

B. Response to Rejection of Claims 1-4, 6-12 and 14-22 under 35 USC 103(a) as Unpatentable over Zhu et al., in view of Litton et al

At pages 2-3 of the Office Action, the Examiner has rejected Claims 1-4, 6-12 and 14-22 under 35 USC 103(a) as unpatentable over Zhu et al., in view of U.S. Patent 6,730,422 (Litton et al.).

As pointed out above with regard to the rejection of Claims 1-2, Zhu et al. does not clearly teach or suggest the use of lanthana, and particularly as the second stabilizer metal oxide in combination with the first stabilizer metal oxide (e.g., yttria) and third stabilizer metal oxide (e.g., ytterbia) of Claims 1-4, 8-12 and 14-22.

In further response to this rejection of Claims 1-4, 6-12 and 14-22, Claims 1-3 have been rewritten as new Claim 24 (ceramic composition), Claims 6 and 10-11 have been rewritten as new Claim 25 (thermally protected article), and 17 and 20-21 have been rewritten as new Claim 26 (method for preparing thermal barrier coating). Each of new Claims 24-26 recite a ceramic composition comprising: (1) from about 92 to about 95 mole % zirconia; and from about 5 to about 8 mole % of a stabilizer component comprising: (a) a first metal oxide selected from yttria, calcia, ceria, scandia, magnesia, india and mixtures thereof in amount of from about 3 to about 5 mole %; (b) a second metal oxide selected from lanthana, alone or in a mixture with gadolinia, neodymia, samaria, or dysprosia, in an amount of from about 0.25 to about 2 mole %; and ytterbia in an amount of from about 0.5 to about 2 mole %.

As pointed out above, Zhu et al. especially does not teach or suggest the ceramic composition of new Claims 24-26 comprising from about 92 to about 95 mole % zirconia, and in particular does not disclose or suggest the stabilizer component combination of: (a) the first metal oxide (e.g., yttria) in amount of from about 3 to about 5 mole %; (b) the second metal oxide being lanthana, alone or in a mixture with gadolinia, neodymia, samaria or dysprosia, in an amount of from about 0.25 to about 2 mole %; and (c) ytterbia in an amount of from about 0.5 to about 2 mole %. Compare also new Claims 24-26, respectively, to Claims 5, 13 and 23 (prior to amendment) that page 4 of the Office Action says would be allowable if rewritten in independent form. Accordingly, Claims 4-5, 7-9, 12-16, 18-19, and 22-26, as amended, are unobvious over Zhu et al.

Regarding Claims 8-12 and 14-23, page 3 of the Office Action concedes that Zhu et al. does not expressly teach an article comprising its TBC coating composition, but alleges that Zhu et al. teaches that its TBC coating composition can be used as a thermal barrier coating for a jet engine turbine blade. The Office Action further relies on Litton et al. to allegedly teach a TBC comprising a zirconia-based ceramic with multiple oxides added thereto, and that Litton et al. also discloses including a bond coat.

Again, for reasons given above, Zhu et al. does not specifically teach or suggest the ceramic compositions of amended Claims 4-5, 7-9, 12-16, 18-19, and 22-26. Litton et al. also does not specifically teach or suggest the ceramic compositions of amended Claims 4-5, 7-9, 12-16, 18-19, and 22-26, and especially the stabilizer component combination of: (a) the first metal oxide (e.g., yttria) in amount of from about 3 to about 5 mole %; (b) the second metal oxide being lanthana, alone or in a mixture with gadolinia, neodymia, samaria or dysprosia, in an amount of from about 0.25 to about 2 mole %; and (c) ytterbia in an amount of from about 0.5 to about 2 mole %.

In addition, for all embodiments specifically disclosed in Litton et al. of TBCs comprising metal oxides of formula A_2O_3 that include lanthanum oxide, the metal oxides of formula A_2O_3 comprise at least 15 mole % of the TBC. By contrast, the ceramic compositions of 4-5, 7-9, 12-16, 18-19, and 22-26, as amended, comprise from about 5 to about 8 mole % combined stabilizer metal oxides, including lanthana. Examples 1, 2 and 3 of Litton et al. also disclose preferred compositions comprising zirconia with yttria, mixtures of yttria and gadolinia, or samaria, but not lanthana. These embodiments and Examples of Litton et al. would further teach away from the ceramic compositions of Claims 4-5, 7-9, 12-16, 18-19, and 22-26, as amended.

Accordingly, Claims 4-5, 7-9, 12-16, 18-19, and 22-26, as amended, are unobvious over Zhu et al, even in view of Litton et al.

C. Response to Objection to Claims 5, 13 and 23

At page 4 of the Office Action, Claims 5, 13 and 23 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claim. For reasons given above, new Claims 24-26, from which amended Claims 5, 13 and 23 ultimately depend, are allowable over the prior art relied on in the Office Action. Accordingly, because amended Claims 5, 13 and 23 now ultimately depend from allowable base/intervening claims, this objection should be withdrawn.

D. Conclusion

In conclusion, Claims 4-5, 7-9, 12-16, 18-19, and 22-26, as amended, are novel and unobvious over the prior art relied in the Office Action. Accordingly, Applicants respectfully request that Claims 4-5, 7-9, 12-16, 18-19, and 22-26, as amended, be allowed to issue in the above application.

Respectfully submitted,

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